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Building & Highway Material Testing Laboratory

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T-2377

Job No.: CTCE/BBMP/W.No.11/BBU/CSR-04/828h/CEMENT/2015-16 Date: 02.05.2015

TEST REPORT ON CEMENT

* CUSTOMER	:	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
*AGENCY	:	**Mr. B.B. Umesh,** #385, Bettaulsur (P), Bangalore North Taluk - 562 157.
*NAME OF THE WORK	:	Improvements & Asphalting to Mariyamma Block Main Road and Opp. Church Road at Gangamma Gudi in Ward No.11, (Kuvempunagara), Vidyaranyapura Sub Division, BBMP, Bangalore.
REFERENCE	:	EE/BTP/BBMP/E-PMT/10(13868)WO/35/2015-16 Dated: 22.04.2015
SAMPLE ID	:	Cement
SAMPLE RECEIVED ON	:	30.04.2015
PERIOD OF TESTING	:	30.04.2015 to 02.05.2015

The results of the tests conducted on the cement sample are as follows:

Sl. No	Descriptions	Test Method as per IS	Test Result	Requirements as per IS: 8112-2013
1	Standard Consistency	IS-4031 (Part -4) 1988(RA-2009)	28.50 %	-
2	a) Initial Setting Time	IS-4031 (Part -5) 1988(RA-2009)	130 Minutes	Not Less than 30 Minutes
	b) Final Setting Time	IS-4031 (Part -5) 1988(RA-2009)	455 Minutes	Not More than 600 Minutes
3	Soundness by Le Chartlier Method	IS-4031 (Part-3) 1988(RA-2009)	1 mm	Not more than 10mm

*Information is furnished by the Customer/Representative.

Note:

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⇒ Any Query regarding the report must be reported within 30 days from the date of testing.

****

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Technical Manager

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Job No.: CTCE/BBMP/W.No.11/BBU/CSR-04/828h/SAND-Gradation/2015-16 : 02.05.2015

TEST REPORT ON DETERMINATION GRADATION OF FINE AGGREGATES

*** Customer** : **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

*** Agency** : **Mr. B.B. Umesh,**
#385, Bettaulsur (P), Bangalore North Taluk - 562 157.

*** Name of Work** : Improvements & Asphalting to Mariyamma Block Main Road and Opp. Church Road at Gangamma Gudi in Ward No.11, (Kuvempunagara), Vidyaranyapura Sub Division, BBMP, Bangalore.

Reference : EE/BTP/BBMP/E-PMT/10(13868)WO/35/2015-16 Dated: 22.04.2015

Technical Reference : IS : 2386 Part 1 - 1963 RA-2007

Sample ID : Fine Aggregates

Sample Received on : 30.04.2015

Date of Testing : 02.05.2015

Total Wt. of Aggregates in gms **1000**

Is Sieve Size in mm	Cumulative Weight Passing in %	Spec.Limits as per IS 383-1970 (RA- 2007)			
		Zone-I	Zone-II	Zone-III	Zone-IV
10	100	100	100	100	100
4.75	92.90	90-100	90-100	90-100	95-100
2.36	76.50	60-95	75-100	85-100	95-100
1.18	48.70	30-70	55-90	75-100	90-100
600 Micron	22.80	15-34	35-59	60-79	80-100
300 Micron	11.30	5-20	8-30	12-40	15-50
150 Micron	5.70	0-10	0-10	0-10	0-15

* Information is furnished by the Customer/Representative

Remarks : This sample is under Zone-I specific limits.

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Job No.: CTCE/BBMP/W.No.11/BBU/WMM/Gradation/2015-16

08.05.2015

GRADATION FOR WMM
MORTH TABLE-400-11

Customer : **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

Agency : **Mr. B.B. Umesh,**
#385, Bettaulsur (P), Bangalore North Taluk - 562 157.

Name of Work : Improvements & Asphalting to Mariyamma Block Main Road and Opp. Church Road at Gangamma Gudi in Ward No.11, (Kuvempunagara), Vidyaranyapura Sub Division, BBMP, Bangalore.

Reference : EE/BTP/BBMP/E-PMT/10(13868)WO/35/2015-16 Dated: 22.04.2015

Date of Testing : 08.05.2015

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): **5000**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	145	145	2.9	97.1	95-100
22.4	1580	1725	34.5	65.5	60-80
11.2	1123	2848	57.0	43.0	40-60
4.75	625	3473	69.5	30.5	25-40
2.36	435	3908	78.2	21.8	15-30
0.600	410	4318	86.4	13.6	8-22
0.075	365	4683	93.7	6.3	0-8

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Job No.: CTCE/BBMP/W.No.11/BBU/WMM/Gradation/2015-16

08.05.2015

GRADATION FOR WMM
MORTH TABLE-400-11

Customer : **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

Agency : **Mr. B.B. Umesh,**
#385, Bettaulsur (P), Bangalore North Taluk - 562 157.

Name of Work : Improvements & Asphalting to Mariyamma Block Main Road and Opp. Church Road at Gangamma Gudi in Ward No.11, (Kuvempunagara), Vidyaranyapura Sub Division, BBMP, Bangalore.

Reference : EE/BTP/BBMP/E-PMT/10(13868)WO/35/2015-16 Dated: 22.04.2015

Date of Testing : 08.05.2015

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): **5000**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	125	125	2.5	97.5	95-100
22.4	1525	1650	33.0	67.0	60-80
11.2	1025	2675	53.5	46.5	40-60
4.75	725	3400	68.0	32.0	25-40
2.36	685	4085	81.7	18.3	15-30
0.600	385	4470	89.4	10.6	8-22
0.075	310	4780	95.6	4.4	0-8

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Job No.: CTCE/BBMP/W.No.11/BBU/WMM/Gradation/2015-16

08.05.2015

GRADATION FOR WMM
MORTH TABLE-400-11

Customer : **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

Agency : **Mr. B.B. Umesh,**
#385, Bettaulsur (P), Bangalore North Taluk - 562 157.

Name of Work : Improvements & Asphalting to Mariyamma Block Main Road and Opp. Church Road at Gangamma Gudi in Ward No.11, (Kuvempunagara), Vidyaranyapura Sub Division, BBMP, Bangalore.

Reference : EE/BTP/BBMP/E-PMT/10(13868)WO/35/2015-16 Dated: 22.04.2015

Date of Testing : 08.05.2015

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): **5000**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	180	180	3.6	96.4	95-100
22.4	1465	1645	32.9	67.1	60-80
11.2	1075	2720	54.4	45.6	40-60
4.75	695	3415	68.3	31.7	25-40
2.36	595	4010	80.2	19.8	15-30
0.600	410	4420	88.4	11.6	8-22
0.075	355	4775	95.5	4.5	0-8

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GRADATION FOR WMM
MORTH TABLE-400-11

Customer : **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

Agency : **Mr. B.B. Umesh,**
#385, Bettaulsur (P), Bangalore North Taluk - 562 157.

Name of Work : Improvements & Asphalting to Mariyamma Block Main Road and Opp. Church Road at Gangamma Gudi in Ward No.11, (Kuvempunagara), Vidyaranyapura Sub Division, BBMP, Bangalore.

Reference : EE/BTP/BBMP/E-PMT/10(13868)WO/35/2015-16 Dated: 22.04.2015

Date of Testing : 08.05.2015

Material : WMM

Sample Location : WMM Mix Plant Oven Dry Wt (gm): **5000**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	135	135	2.7	97.3	95-100
22.4	1535	1670	33.4	66.6	60-80
11.2	1045	2715	54.3	45.7	40-60
4.75	675	3390	67.8	32.2	25-40
2.36	385	3775	75.5	24.5	15-30
0.600	480	4255	85.1	14.9	8-22
0.075	580	4835	96.7	3.3	0-8

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Job No.: CTCE/BBMP/W.No.11/BBU/WMM/AIV/2015-16 08.05.2015

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Mr. B.B. Umesh,** #385, Bettaulsur (P), Bangalore North Taluk - 562 157.
Name of the Work	Improvements & Asphalting to Mariyamma Block Main Road and Opp. Church Road at Gangamma Gudi in Ward No.11, (Kuvempunagara), Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/10(13868)WO/35/2015-16 Dated: 22.04.2015
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	08.05.2015

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	378	382	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	79	83	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	299	299	
4	Aggregate Impact value = percent fines	20.90	21.73	
	100* (W_2/W_1)%			**21.31**

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

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Job No.: CTCE/BBMP/W.No.11/BBU/WMM/AIV/2015-16 08.05.2015

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Mr. B.B. Umesh,** #385, Bettaulsur (P), Bangalore North Taluk - 562 157.
Name of the Work	Improvements & Asphalting to Mariyamma Block Main Road and Opp. Church Road at Gangamma Gudi in Ward No.11, (Kuvempunagara), Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/10(13868)WO/35/2015-16 Dated: 22.04.2015
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	08.05.2015

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	380	384	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	81	85	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	299	299	
4	Aggregate Impact value = percent fines	21.32	22.14	
	100* (W_2/W_1)%			**21.73**

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

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Job No.: CTCE/BBMP/W.No.11/BBU/WMM/S-T/2015-16 08.05.2015

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Mr. B.B. Umesh,** #385, Bettaulsur (P), Bangalore North Taluk - 562 157.
Name of Work	Improvements & Asphalting to Mariyamma Block Main Road and Opp. Church Road at Gangamma Gudi in Ward No.11, (Kuvempunagara), Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/10(13868)WO/35/2015-16 Dated: 22.04.2015
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	08.05.2015

Civil-Tech Consultants & Engineers Bangalore

Result : Flakiness Index = **12.32%**

Elongation Index = **13.41%**

Result : Combined Flakiness & Elongation index 25.73%

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

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Job No.: CTCE/BBMP/W.No.11/BBU/WMM/S-T/2015-16 08.05.2015

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Mr. B.B. Umesh,** #385, Bettaulsur (P), Bangalore North Taluk - 562 157.
Name of Work	Improvements & Asphalting to Mariyamma Block Main Road and Opp. Church Road at Gangamma Gudi in Ward No.11, (Kuvempunagara), Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/10(13868)WO/35/2015-16 Dated: 22.04.2015
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	08.05.2015

Civil-Tech Consultants & Engineers Bangalore

Result : Flakiness Index = **11.57%**

Elongation Index = **13.89%**

Result : Combined Flakiness & Elongation index 25.46%

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

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Job No: CTCE/BBMP/W.No.11/BBU/CSR-04/828h/SDBC(QB)/2015-16 25.05.2015

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

*CUSTOMER	:	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
*AGENCY	:	**Mr. B.B. Umesh,** #385, Bettaulsur (P), Bangalore North Taluk - 562 157.
*NAME OF THE WORK	:	Improvements & Asphalting to Mariyamma Block Main Road and Opp. Church Road at Gangamma Gudi in Ward No.11, (Kuvempunagara), Vidyaranyapura Sub Division, BBMP, Bangalore.
REFERENCE	:	EE/BTP/BBMP/E-PMT/10(13868)WO/35/2015-16 Dated: 22.04.2015
*SAMPLE ID	:	Bitumen
DATE OF SAMPLING	:	23.05.2015
PERIOD OF TESTING	:	25.05.2015

The results of the tests conducted on the bitumen sample using for Semi Dense Bituminous Concrete.

Sl. No	Description	Test Method as per IS	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	IS :1203 -1978 (RA-2009)	91	80 to 100
2	Softening point, ^{0}C	IS :1205 -1978 (RA-2009)	42	Min. 40
3	Ductility at 27^{0}C, cm	IS :1208 -1978 (RA-2009)	100 >	Min. 75
4	Flash Point, ^{0}C	IS :1209 -1978 (RA-2009)	286	Min. 220

*Information is furnished by the Customer/Representative.

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VIDYARANI P.K.
Technical Manager

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Job No.: CTCE/BBMP/W.No.11/BBU/SDBC/AIV/2015-16 25.05.2015

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Mr. B.B. Umesh,** #385, Bettaulsur (P), Bangalore North Taluk - 562 157.
Name of the Work	Improvements & Asphalting to Mariyamma Block Main Road and Opp. Church Road at Gangamma Gudi in Ward No.11, (Kuvempunagara), Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/10(13868)WO/35/2015-16 Dated: 22.04.2015
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	25.05.2015

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	377	381	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	78	82	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	299	299	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	20.69	21.52	**21.11**

Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

Note:

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Job No.: CTCE/BBMP/W.No.11/BBU/SDBC/AIV/2015-16 25.05.2015

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Mr. B.B. Umesh,** #385, Bettaulsur (P), Bangalore North Taluk - 562 157.
Name of the Work	Improvements & Asphalting to Mariyamma Block Main Road and Opp. Church Road at Gangamma Gudi in Ward No.11, (Kuvempunagara), Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/10(13868)WO/35/2015-16 Dated: 22.04.2015
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	25.05.2015

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	380	384	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	81	84	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	299	300	
4	Aggregate Impact value = percent fines / $100^* (W_2/W_1)\%$	21.32	21.88	**21.60**

Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

Note:

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Job No.: CTCE/BBMP/W.No.11/BBU/SDBC/Shape_T/2015-16 25.05.2015

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Mr. B.B. Umesh,** #385, Bettaulsur (P), Bangalore North Taluk - 562 157.
Name of Work	Improvements & Asphalting to Mariyamma Block Main Road and Opp. Church Road at Gangamma Gudi in Ward No.11, (Kuvempunagara), Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/10(13868)WO/35/2015-16 Dated: 22.04.2015
Technical Reference	IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	25.05.2015

Result : Flakiness Index = **11.28%**

Elongation Index = **13.64%**

Result : Combined Flakiness & Elongation index **24.92%**

Comments:

→ Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

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Job No.: CTCE/BBMP/W.No.11/BBU/SDBC/Shape_T/2015-16 25.05.2015

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Mr. B.B. Umesh,** #385, Bettaulsur (P), Bangalore North Taluk - 562 157.
Name of Work	Improvements & Asphalting to Mariyamma Block Main Road and Opp. Church Road at Gangamma Gudi in Ward No.11, (Kuvempunagara), Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/10(13868)WO/35/2015-16 Dated: 22.04.2015
Technical Reference	IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	25.05.2015

Civil-Tech Consultants & Engineers Bangalore

Result : Flakiness Index = **12.37%**

Elongation Index = **13.53%**

Result : Combined Flakiness & Elongation index **25.90%**

Comments:

→ Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

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Job No.: CTCE/BBMP/W.No.11/BBU/SDBC/Stripping/2015-16 27.05.2015

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Customer	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Mr. B.B. Umesh,** #385, Bettaulsur (P), Bangalore North Taluk - 562 157.
Name of the work	Improvements & Asphalting to Mariyamma Block Main Road and Opp. Church Road at Gangamma Gudi in Ward No.11, (Kuvempunagara), Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/10(13868)WO/35/2015-16 Dated: 22.04.2015
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	27.05.2015

Type of binder : 80/100
Percentage of binder used : 5.0% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.0 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	2.8	2.93	97.07
2	2.9		
3	3.1		

Comments:

→ Minimum allowable Aggregate retained coating for Semi Dense Bituminous Concrete is 95%

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Job No.: CTCE/BBMP/W.No.11/BBU/SDBC/Sp_Wa/2015-16 27.05.2015

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Customer	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Mr. B.B. Umesh,** #385, Bettaulsur (P), Bangalore North Taluk - 562 157.
Name of the Work	Improvements & Asphalting to Mariyamma Block Main Road and Opp. Church Road at Gangamma Gudi in Ward No.11, (Kuvempunagara), Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/10(13868)WO/35/2015-16 Dated: 22.04.2015
Type of Mix	Semi Dense Bituminous Concrete
Source / Location	Hotmix Plant, Bangalore
Date of Testing	27.05.2015

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2025	2023	2027	
2	Weight of basket suspended in water	W_2 g	750	750	750	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1275	1273	1277	
4	Weight of saturated surface dry aggregate in air	W_3 g	2018	2017	2020	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	743	744	743	
6	Weight of oven dried aggregate	W_4 g	2004	2005	2007	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.697	2.695	2.701	2.698
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.749	2.739	2.749	2.746
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.70%	0.60%	0.65%	0.65%

Comments:

→ Maximum allowable Aggregate Water absorption value for Semi Dense Bituminous Concrete is 2 %

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Job No.: CTCE/BBMP/W.No.11/BBU/SDBC/Bitumen/2015-16 27.05.2015

BITUMEN DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

AS per IRC : SP : 11 - 1984

CUSTOMER	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
AGENCY	**Mr. B.B. Umesh,** #385, Bettaulsur (P), Bangalore North Taluk - 562 157.
NAME OF THE WORK	Improvements & Asphalting to Mariyamma Block Main Road and Opp. Church Road at Gangamma Gudi in Ward No.11, (Kuvempunagara), Vidyaranyapura Sub Division, BBMP, Bangalore.
REFERENCE	EE/BTP/BBMP/E-PMT/10(13868)WO/35/2015-16 Dated: 22.04.2015
SAMPLE I/D	Roads at Mariyamma Block Main Road, Ward No. 11
DATE OF TESTING	27.05.2015

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	475	474
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	25	26.00
7. Bitumen content in %	5.00	5.20
8. Average	**5.10**	

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Job No.: CTCE/BBMP/W.No.11/BBU/SDBC/Bitumen/2015-16 27.05.2015

GRADATION DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

As per IS : 2386 and IRC : SP : 11 - 1984

CUSTOMER	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
AGENCY	**Mr. B.B. Umesh,** #385, Bettaulsur (P), Bangalore North Taluk - 562 157.
NAME OF THE WORK	Improvements & Asphalting to Mariyamma Block Main Road and Opp. Church Road at Gangamma Gudi in Ward No.11, (Kuvempunagara), Vidyaranyapura Sub Division, BBMP, Bangalore.
REFERENCE	EE/BTP/BBMP/E-PMT/10(13868)WO/35/2015-16 Dated: 22.04.2015
SAMPLE I/D	Roads at Mariyamma Block Main Road, Ward No. 11
DATE OF TESTING	27.05.2015

GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	27.15	5.72	5.72	94.28	90-100
4.75	252.63	53.19	58.90	41.10	35-51
2.36	55.98	11.79	70.69	29.31	24-39
1.18	53.14	11.19	81.87	18.13	15-30
0.3	25.48	5.36	87.24	12.76	9-19
0.075	37.98	8.00	95.23	4.77	3-8

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	34.28	7.23	7.23	92.77	90-100
4.75	263.87	55.67	62.90	37.10	35-51
2.36	56.41	11.90	74.80	25.20	24-39
1.18	42.16	8.89	83.70	16.30	15-30
0.3	25.98	5.48	89.18	10.82	9-19
0.075	29.57	6.24	95.42	4.58	3-8

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Job No.: CTCE/BBMP/W.No.11/BBU/SDBC/AGG/2015-16 27.05.2015

Aggregate Gradation Test

IS : 2386 Part I

Customer	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Mr. B.B. Umesh,** #385, Bettaulsur (P), Bangalore North Taluk - 562 157.
Name of the Work	Improvements & Asphalting to Mariyamma Block Main Road and Opp. Church Road at Gangamma Gudi in Ward No.11, (Kuvempunagara), Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/10(13868)WO/35/2015-16 Dated: 22.04.2015
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete (SDBC)
Date of Testing	27.05.2015

Total Weight of Sample: **5700** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade II MORTH specification
9.5	435	7.6	7.63	92.37	90-100	
4.75	2970	52.1	59.74	40.26	35-51	
2.36	745	13.1	72.81	27.19	24-39	
1.18	460	8.1	80.88	19.12	15-30	
0.3	390	6.8	87.72	12.28	9-19	
0.075	320	5.6	93.33	6.67	3-8	

Total Weight of Sample: **5550** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade II MORTH specification
9.5	390	7.0	7.03	92.97	90-100	
4.75	2955	53.2	60.27	39.73	35-51	
2.36	625	11.3	71.53	28.47	24-39	
1.18	430	7.7	79.28	20.72	15-30	
0.3	370	6.7	85.95	14.05	9-19	
0.075	490	8.8	94.77	5.23	3-8	

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Job No.: CTCE/BBMP/W.No.11/BBU/SDBC/Stability/2015-16 27.05.2015

TEST REPORT ON STABILITY OF MIX

Customer	:	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	:	**Mr. B.B. Umesh,** #385, Bettaulsur (P), Bangalore North Taluk - 562 157.
Name of the Work	:	Improvements & Asphalting to Mariyamma Block Main Road and Opp. Church Road at Gangamma Gudi in Ward No.11, (Kuvempunagara), Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	:	EE/BTP/BBMP/E-PMT/10(13868)WO/35/2015-16 Dated: 22.04.2015
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Semi Dense Bituminous Concrete
Date of Testing	:	27.05.2015

The results of the tests conducted on the Semi Dense Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-16)
1	Marshal Stability, Kn	8.25	8.60	8.2 Kn (min)
2	Marshal flow, mm	2.80	3.75	2 – 4
3	Percent air voids in Mineral Aggregate	4.35	3.50	3 – 5
4	Voids in Compacted Mix	14.40	13.85	13 – 15
5	Percent Voids filled with Bitumen	69.85	70.20	65 - 78
6	Density, g/cc	2.27	2.26	--

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